

## **Amendments to the Specifications**

Please replace paragraph [0021] as published with the following paragraph:

[0015] If we divide 1200 FiberColors by the number of area codes (250) ~~[[ (300) ]]~~ we have an average of 4.8 FiberColors per area code. However, the 1200 outgoing FiberColors from any particular area code (say San Diego) are allocated based on usage demand to the 250 area codes with a total bandwidth of .about.15 THz per fiber. For instance, the FiberColors for traffic from San Diego might be allocated at a particular time as follows: 10 for traffic to Washington, 6 for traffic to Seattle, 1 for traffic to Atlanta, etc., until all 1200 FiberColors are accounted for. It is expected that the actual allocation will be automatically adjusted periodically as demand shifts with time of day and day of the week. Therefore, at any particular time, the OXC switches must be configured so that each FiberColor from each origination area code is guided through the network to its destination area code without interference. (That is, the same fiber cannot be used simultaneously for two FiberColors operating at the same wavelength). It was not immediately obvious that this could be done, but applicants have developed an algorithm for accomplishing this task which appears to be robust and to converge in a practically short time. We call this algorithm a Magic Square Algorithm, because the underlying matrices of FiberColors which need to be allocated have rows and columns which add up to the same number. This problem of allocating FiberColors along with its solution is discussed in detail in the section of this specification entitled "Magic Square Software." The solution of this problem is a key technical innovation, as it enables the deployment of a nation-scale all-optical network with a relatively small number of channels without the disadvantages of having to convert any optical signal to an electrical signal or to another DWDM wavelength between the data source and the data destination area codes.

Please replace paragraph [0022] as published with the following amended paragraph:

[0022] The process of modulating data from the end user onto a particular optical subfrequency is shown in FIG. 7. The optical signal originating from a reference fiber (after appropriate optical amplification) is passed through a narrowband tunable filter 40 to isolate the desired subfrequency. (The tunable filter can be calibrated by sweeping over the subfrequency comb). The isolated narrowband frequency source is sent through an arrangement of electro-optic modulators 42. The modulation source is obtained from the end user by passing the upstream RF cable signal through an RF filter to isolate the 25 MHz of user data and passing that through a frequency converter so that it is at the frequency offset (designated by the network control for the particular end to end data transmission session) as shown at 44. The output

of the EO modulator arrangement contains some residual reference signal, along with the 25 MHz of user data at the appropriate optical frequency offset. Details of how the electro-optic modulator achieves this result while minimizing extraneous sidebands are given below in a section entitled [[\_\_\_\_]] "Network Node Modulator". This is a critical technology for the proposed ColorFast network. The different modulator outputs are then combined passively (with appropriate filtering and optical amplification) resulting in a broadband signal to be transmitted across the network on a particular FiberColor.

Please replace paragraph [0067] with the following amended paragraph and delete the erroneously inserted figure on page 7 of the published application:

[0067] The algorithm iteratively assigns wavelengths in such a way as to avoid collisions[[:]].